

**Pratiksha soni**

**BPT 4th Year**

**Bell's Palsy**

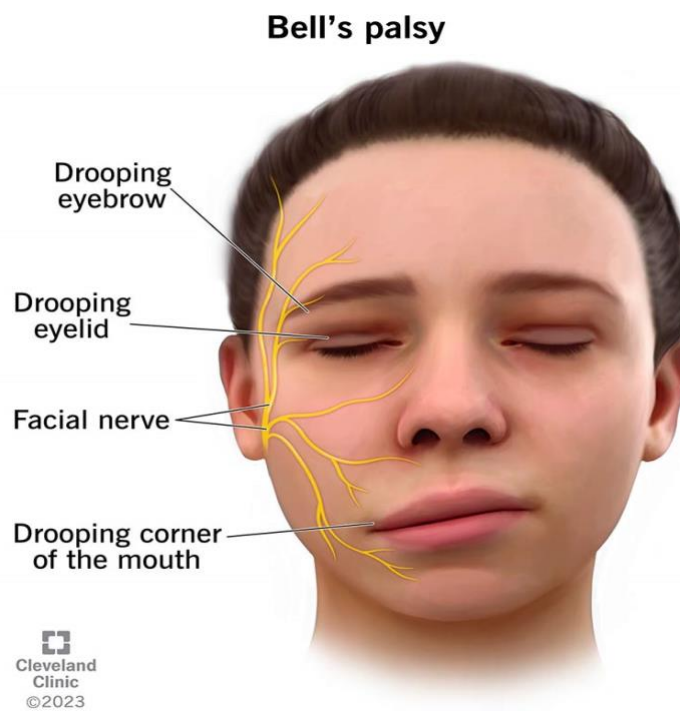
# Content

1. Introduction
2. Anatomy of the facial nerve
3. Causes
4. Types of nerve injury
5. Sign and symptoms
6. Risk factors
7. Diagnosis
8. Management
9. Medical management
10. Surgical management
11. Physiotherapy management
12. Common Assessment
13. Case Study
14. Review of literature

# Introduction

## Bell's palsy

- Bell's palsy is a facial paralysis of acute onset presumed to be due to non-suppurative inflammation of unknown etiology of the facial nerve within its canal above the stylomastoid foramen.
- Bell's palsy can affect anyone at any age. Bell's palsy is a peripheral palsy of the facial nerve that results in muscles weakness on the one side of the face.
- Bell's palsy develop a droopy appearance on one or something both side their face.
- It's a condition in which the muscles in your face become weakened or paralyzed.
- The conditions isn't serious and the symptoms usually start to improve within a few week, with complete recovery in about six months.



# **Anatomy of the facial nerve**

# Anatomy

## Introduction

Facial nerve is a seventh cranial nerve. It contains motor, sensory and parasympathetic nerve fibers which provide innervation of many areas of the head and neck region. It arises from the lower pons.

## Structure

Each of your facial nerves extends from your brain throughout your face like a tree root. The structure (anatomy) of your facial nerve.

- Start in your brain stem.
- Travel through the base of your skull near the vestibulocochlear nerve.
- Enters your face through an opening in a bone near the base of your ear.
- Branches out through an opening near your parotid gland, a major salivary gland. From there, the motor branches spread out to various parts of your face and into the neck.

## Function

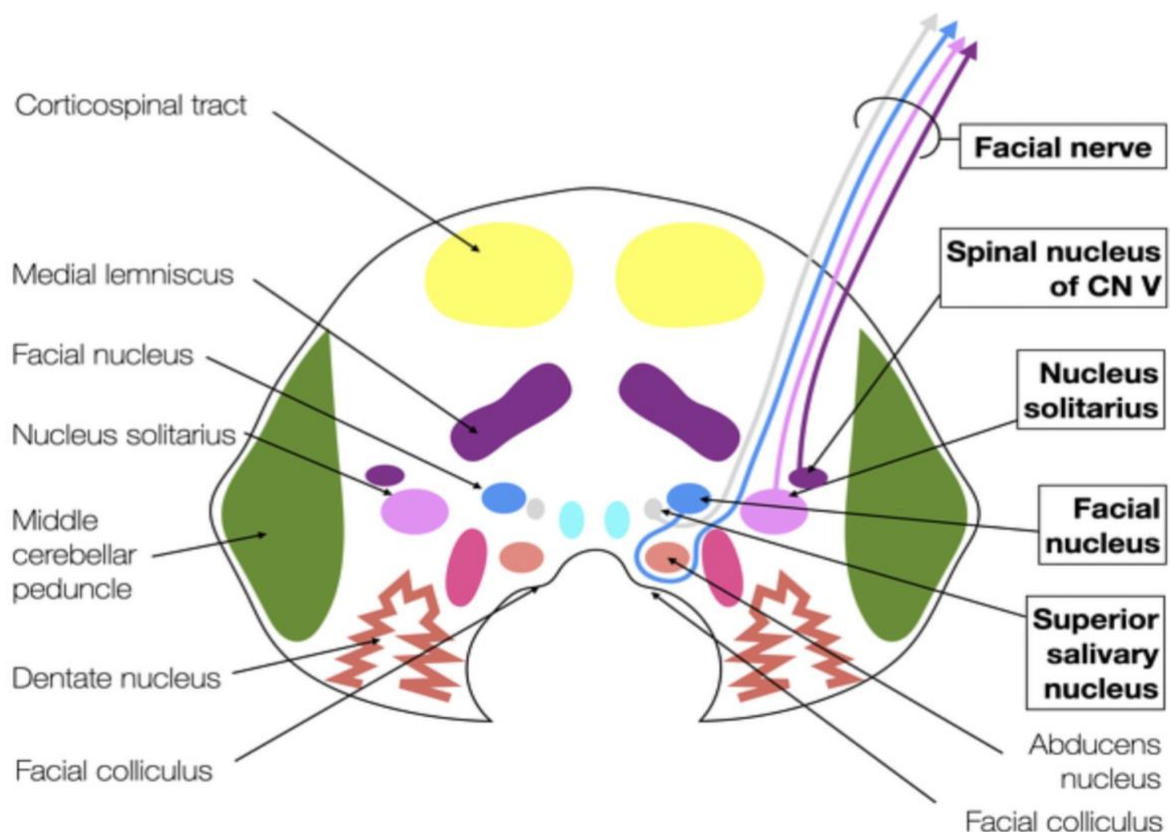
There are four major functions of the facial nerve:

- General somatic efferent (motor supply to facial muscles).

- General visceral efferent (parasympathetic secretomotor supply to submandibular and sublingual salivary glands and the lacrimal gland).
- Special visceral afferent (taste sensation from the anterior two-thirds of the tongue).
- General somatic afferent (cutaneous sensations from the pinna and the external auditory meatus).

## Facial nerve

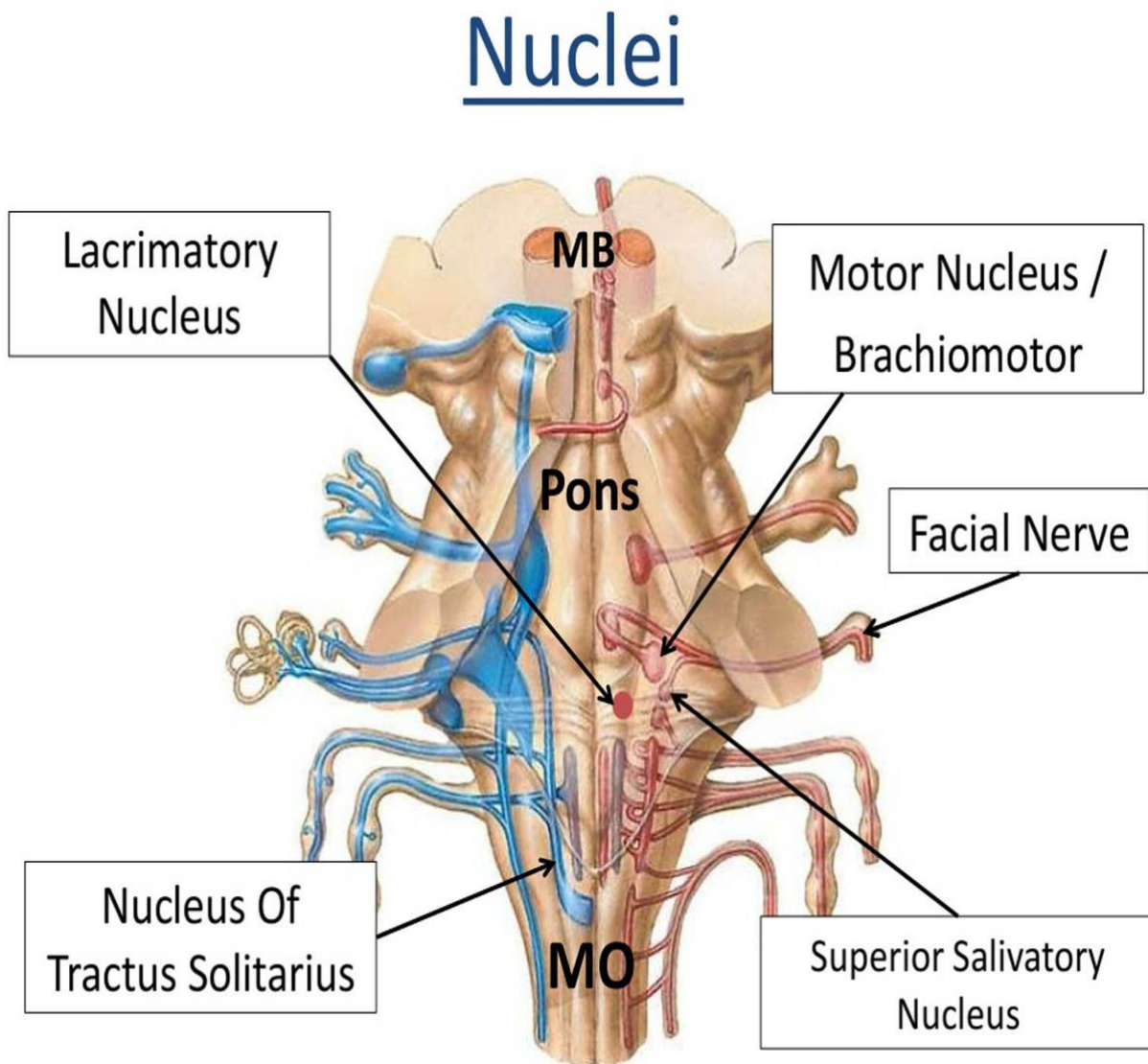
CN VII



## Nuclei

The fiber of the nerve are connected to four nuclei situated in the lower pons.

1. Motor nucleus or branchiomotor.
2. Superior salivatory nucleus or parasympathetic.
3. Lacratory nucleus is also parasympathetic.
4. Nucleus of the tractus solitaries.

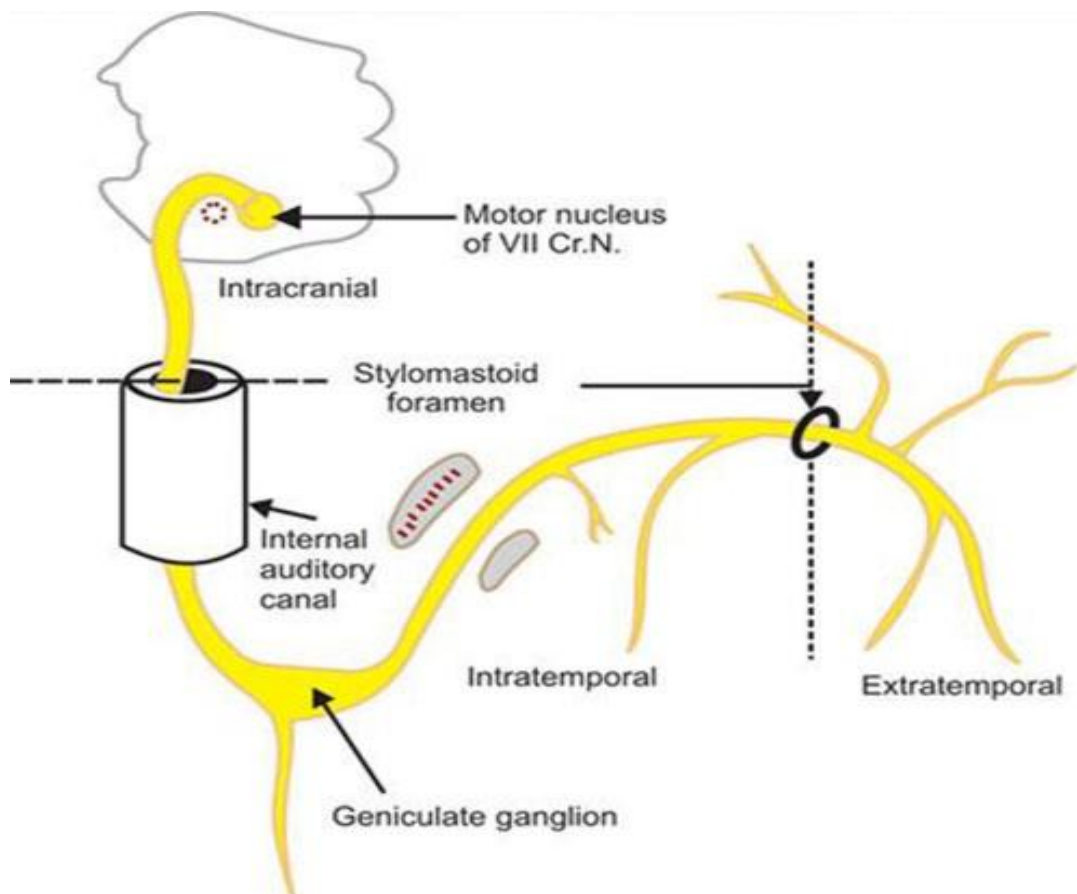




## Course

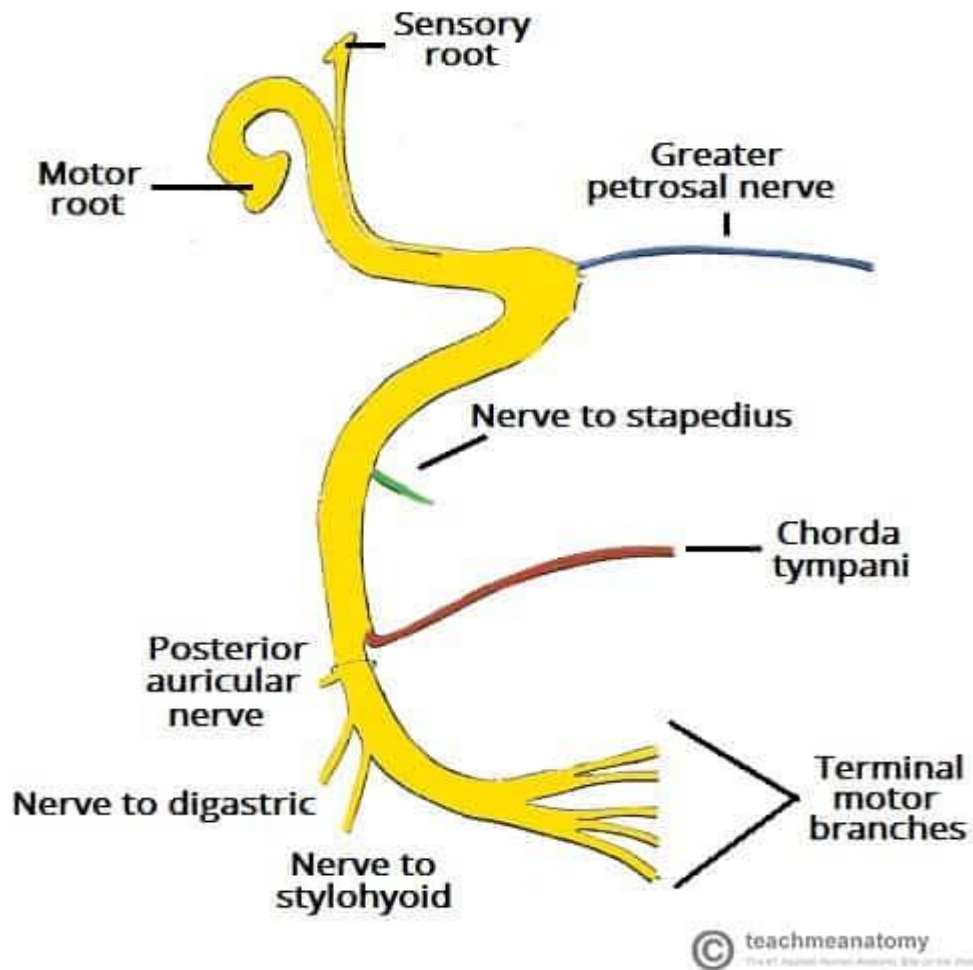
### Intracranial

- The facial nerve is attached to the brainstem by two roots – motor and sensory. The sensory root is also called the nervus intermedius. The two roots of the facial nerve are attached to the lower border of the pons just medial to eighth cranial nerve. The two roots run laterally and forwards and to reach the internal acoustic meatus.
- At the meatus, the motor root lies in the groove on the eighth nerve, with the sensory root intervening. At the bottom of the meatus, the two roots, sensory and motor, fuse to form a single trunk, which lies in the petrous temporal bone.
- Within the canal, the course of the nerve can be divided into three parts by two bends.
- The first part is directed laterally above the vestibule; the second part runs backwards, above the promontory and the third part is directed vertically downward behind the promontory.
- The first bend at the junction of the first and second part is sharp. It lies over the anterior superior part of the promontory, and is called the genu.
- The second bend is gradual, and lies between the promontory and the aditus to the mastoid antrum. The facial nerve leaves the skull by passing through the stylomastoid foramen.



## Extracranial

- The facial nerve crosses the lateral side of the base of the styloid process. It enters the posteromedial surface of the parotid gland and runs forward through the gland crossing the retromandibular vein and the external carotid artery.
- Behind the neck of the mandible it divides into its five terminal branches which emerge from the parotid gland.

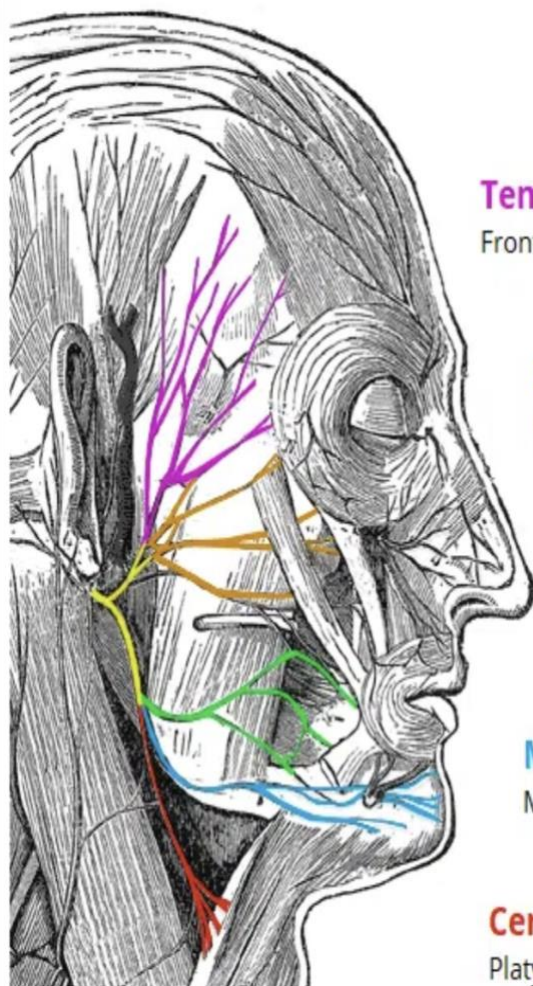


## Branches

1. Within the facial canal:
  - A. Greater petrosal nerve
  - B. The nerve to the stapedius
  - C. The chorda tympani
2. At its exit from the stylomastoid foramen:
  - A. Posterior auricular
  - B. Digastric
  - C. Stylohyoid

### 3. Terminal branches within the paratid gland:

- A. Terminal
- B. Zygomatic
- C. Buccal
- D. Marginal mandibular
- E. Cervical



#### Temporal branches

Frontalis, orbicularis oculi, corrugator supercilii

#### Zygomatic branches

Orbicularis oculi

#### Buccal branches

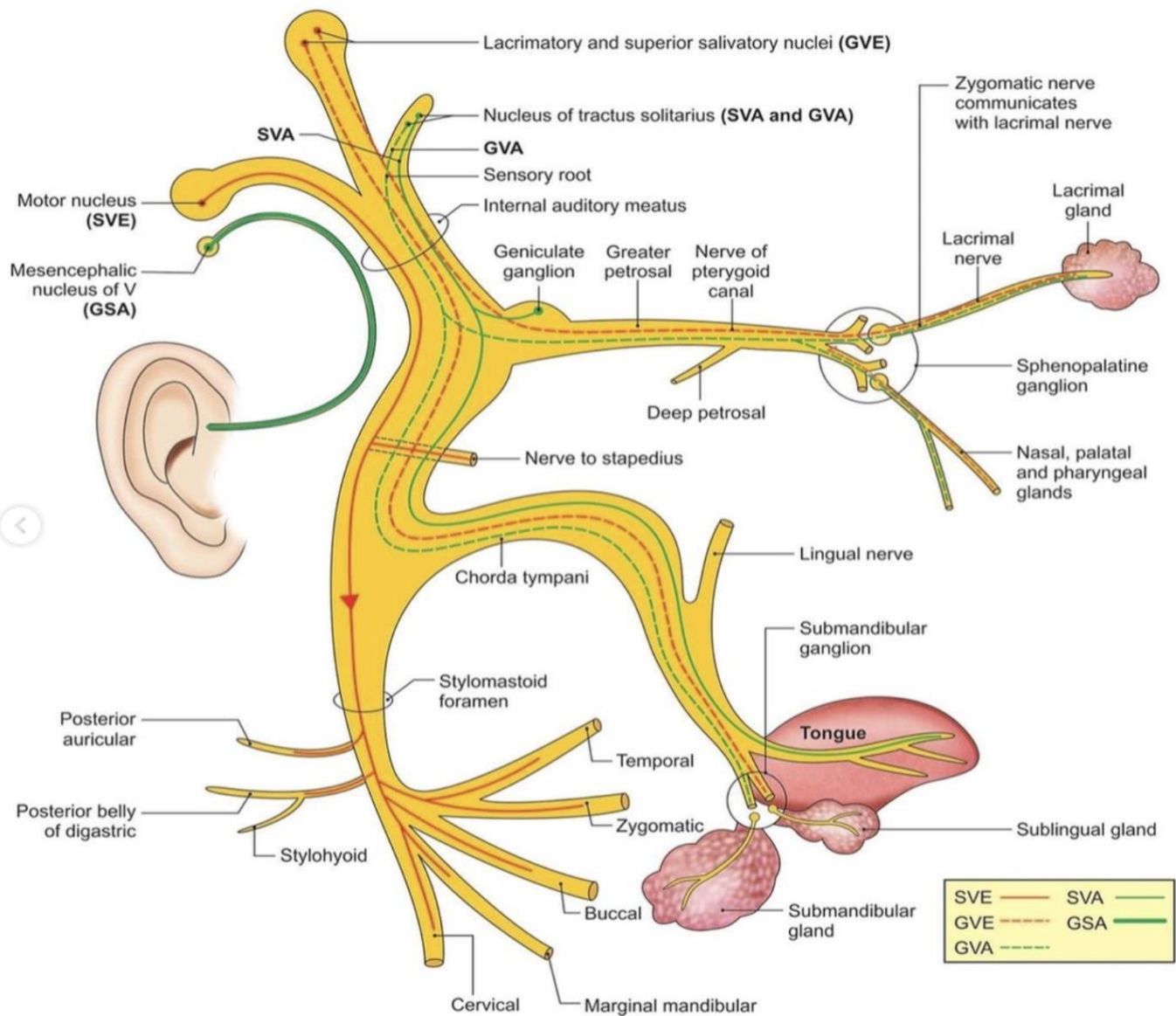
Orbicularis oris, buccinator, zygomaticus

#### Marginal mandibular branches

Mentalis, depressor labii inferioris, depressor anguli oris

#### Cervical branches

Platysma



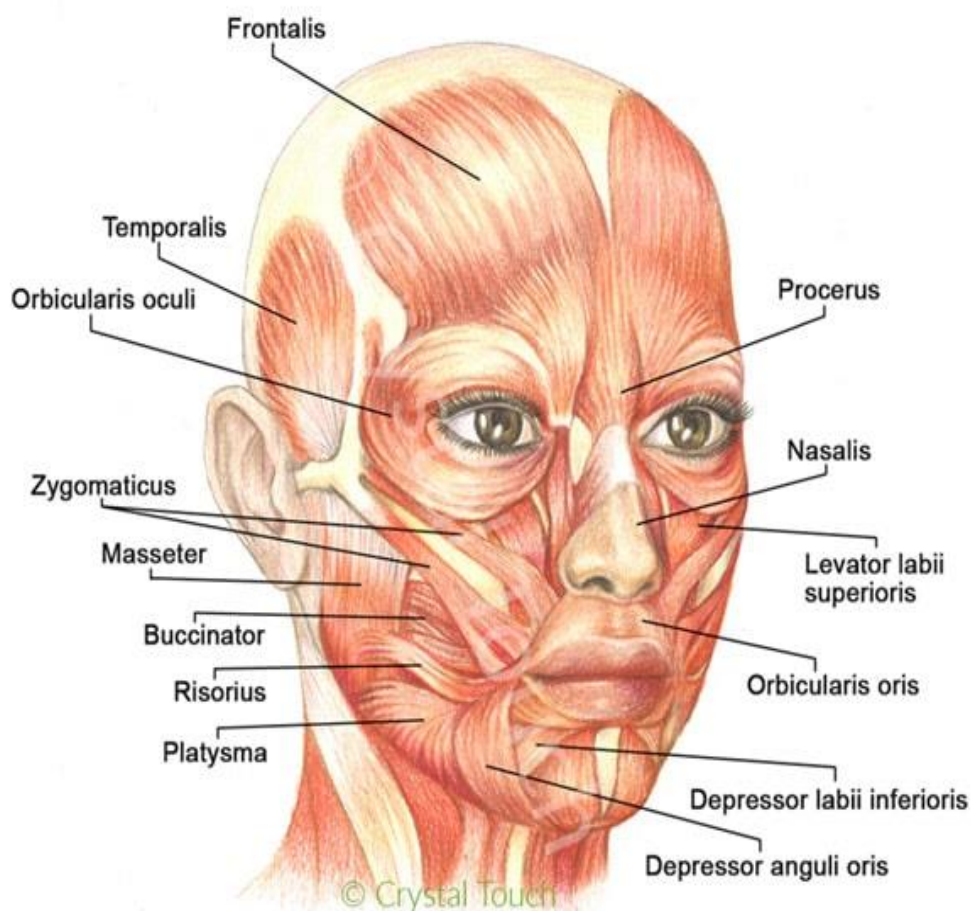
**Fig. 4.36:** Distribution of functional components of VII nerve

## Muscles

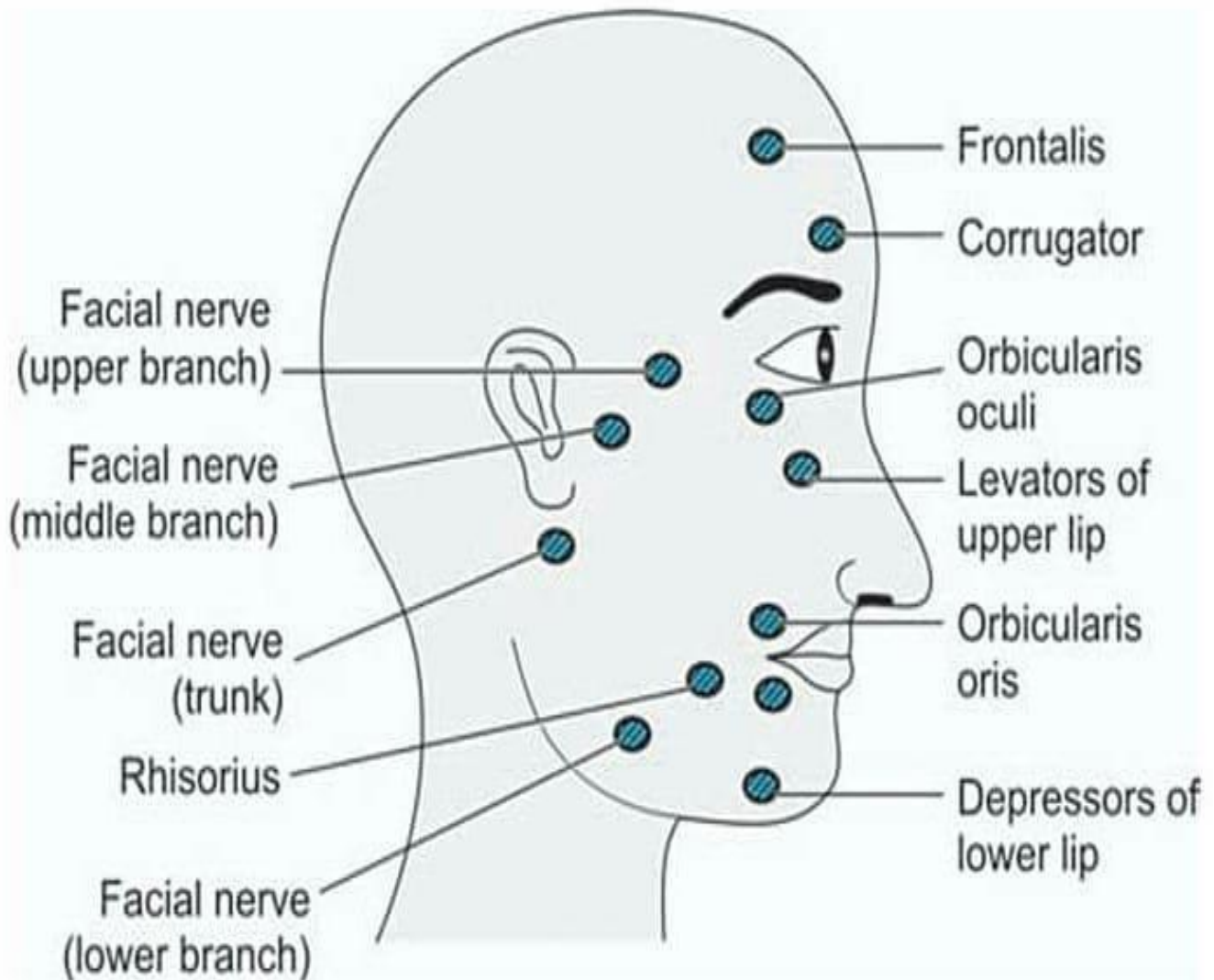
- Frontalis muscle – lifts the eyebrows, makes horizontal forehead wrinkles when we are surprised.
- Orbicularis oculi – the circular muscle of the eye (consists of two muscles). Closes the eyelids, squints the eye. These two muscles are antagonists. Lift and hold your eyebrow with your finger and then try to squint your eyes. Difficult, isn't it?
- Procerus – is a frown muscle. Pulls medial sides of eyebrows down and together.
- Corrugator superclii – pulls eyebrows together.
- Zygomatic muscles (major and minor) – move the mouth corners up and outward when we smile.
- Risorius – the “smile” muscle. Pulls mouth corners laterally (outward) and forms dimples in the cheeks. This muscle is not always active in all people.
- Orbicularis oris – the circular muscle of the mouth. Puckers the lips and brings mouth corners towards the middle line.
- Depressor anguli oris – pulls mouth corners downward.



- Levator labii superioris and depressor labii inferioris – pull the upper and lower lips up and down respectively when we grin.
- Mentalis – the chin muscle. Pulls up the chin as we express disappointment, doubt and some other negative emotions.
- Platysma – it is a surface muscle of the neck. The platysma is engaged in the expressions of fear, disgust and some other negative emotions.



## MOTOR POINTS



**Fig. 2.6:** Motor points of the muscles supplied by the facial nerve



# CAUSES

## CAUSES

- Infection of the ear
- Herpes zoster infection
- Upper respiratory tract infection
- Idiopathic.
- Diabetes
- High blood pressure
- Lyme disease
- Guillain barre syndrome
- History of exposure of ear to extreme cold
- Water retention in pregnancy

## Supranuclear Lesion

- Supranuclear lesion involving the corticospinal fibers concerning voluntary facial movements. Here the lower part of the face is involved whereas the upper part is relatively spared. The Bell's palsy in this case is lower motor neuron types of palsy.
- Supranuclear lesion involving the fibers concerned in emotional movement of the face, e.g. there is a frontal lobe tumor or mimic paralysis.

## Nuclear and Infranuclear Lesions

Here the upper part of face is also involved and the paralysis is lower motor neuron type.

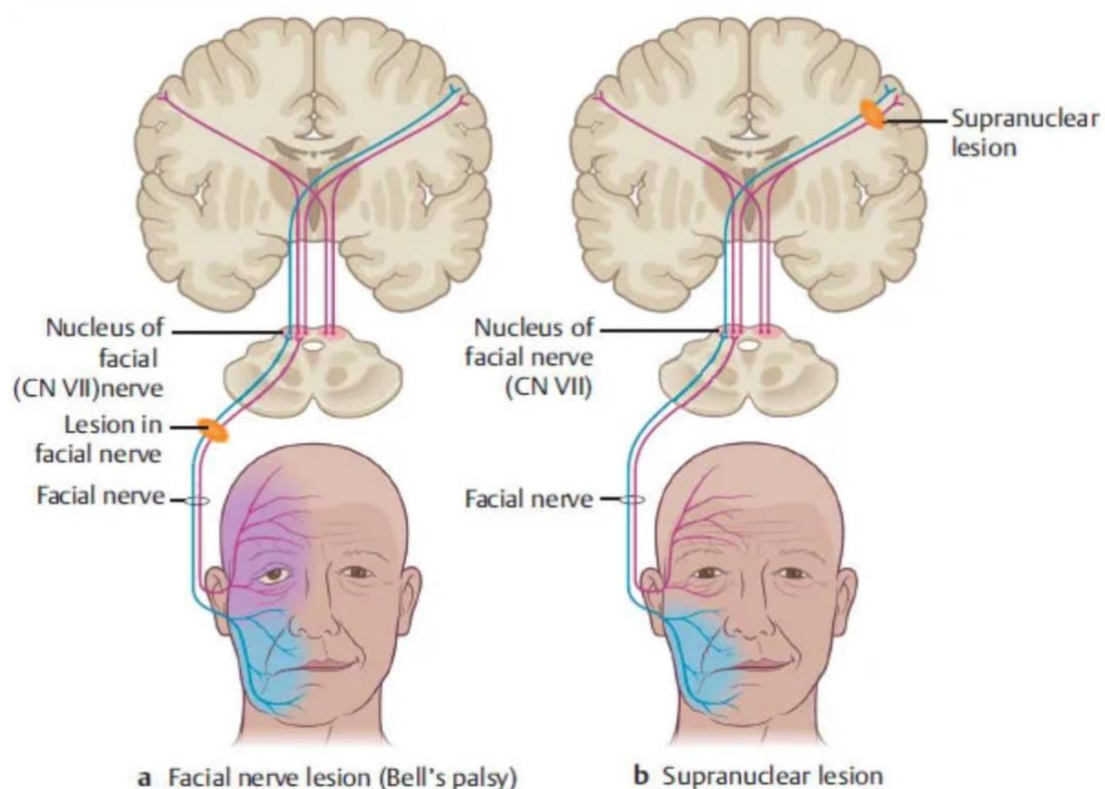
- Pontine lesions: Here the facial nerve palsy is associated with V and VI nerve palsy also. Therefore there is paralysis of lateral rectus, conjugate ocular deviation to the same side and paralysis of ipsilateral jaw muscles. These lesion are

tumors, syringomyelia, vascular lesions, poliomyelitis and multiple sclerosis.

- Within the posterior fossa: (between the pons and internal acoustic meatus): Here the facial nerve palsy is associated with the VIII nerve involvement and nervous intermedius. Therefore it is associated with deafness and loss of taste in the anterior 2/3rd of the tongue. These lesions are acoustic neuroma and cerebellar pontine angle tumors.

- Within temporal bone: Within the facial canal, the Bell's palsy occurs because of the following reasons:

1. Skull fractures
2. Infection in the middle ear and mastoid ,i.e.Otitis media.
3. Spread of infection to the facial canal
4. Surgical operations on the ear
5. Herpes zoster infection
6. Inflammations of the facial nerve within the stylomastoid



## Types of nerve injury

## Types of nerve injury

There are two classifications of nerve injury -

1. Seddom
2. Sutherlands

1.The **Seddom** classification is neurapraxia, axonotmesis and neurotmesis.

### Neurapraxia

In this there is a block in the conduction of impulse down the nerve fiber and recovery takes place without wallerian degeneration.

### Axonotmesis

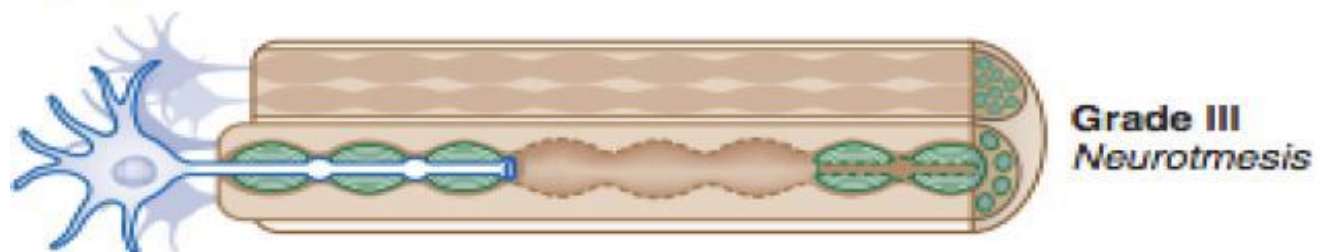
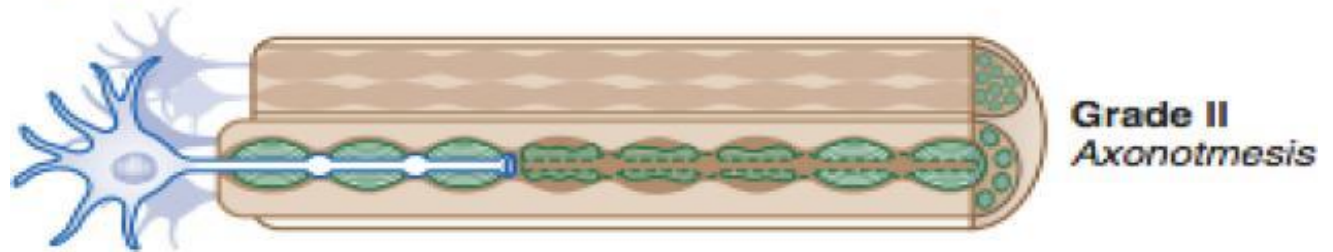
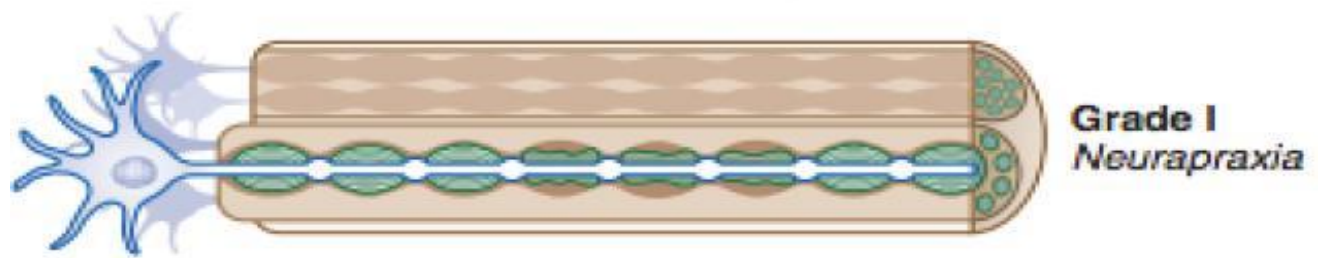
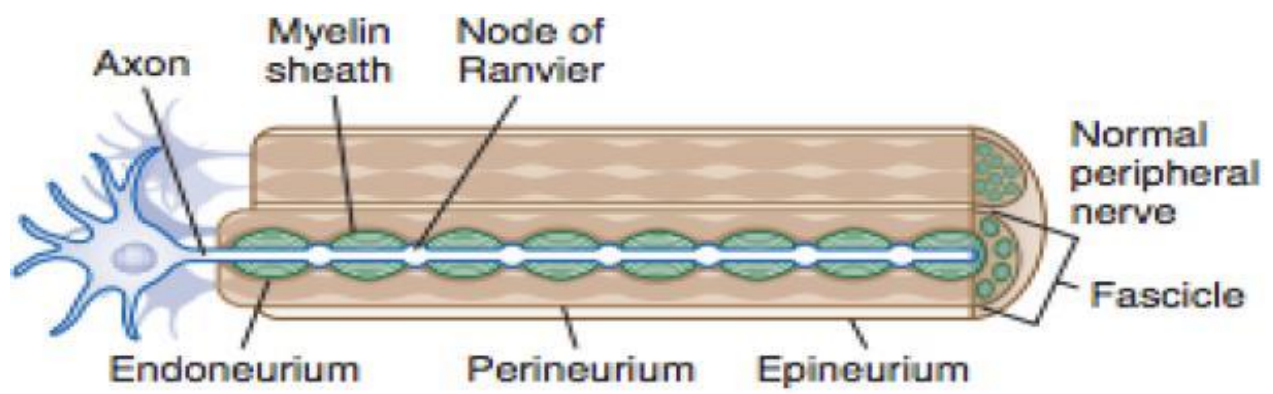
In axonotmesis there is loss of relative continuity of the axon with its myelin sheath but with an intact connective tissue framework hence wallerian degeneration is a must to occur. During the initial stage of axonotmesis it become very difficult to differentiate between neurapraxia and axonotmesis both clinically and through electro- physiological investigations.

### Neurotmesis

Injuries which cause nerve contusion, severe stretch or laceration produce neurotmesis in which not only the axon but even the investing connective tissue framework gets disrupted and lose their continuity. Example of a neurotmesis is nerve transection because in this both the axon and the connective tissue loose its continuity.

2. The Sutherlands on the other hand classified nerve injury into five grades which are as follows.

- 1) [Grade I](#) or first degree nerve injury which corresponds to a neurapraxia.
- 2) [Grade II](#) or second degree injury involves loss of axon continuity with preservation of endoneurium and fascicular structure.
- 3) [Grade III](#) or third degree injury is a mixed axonotmetic neurotmetic type of injury wherein both axons and endoneurium are damaged but most of the perineurium and therefore the fascicular structures is maintained.
- 4) [Grade IV](#) or fourth degree injury involves loss of axons, endo- neurium, perineurium with absence of fascicular structure. The continuity of the nerve trunk is maintained only by the intact epineurium.
- 5) [Grade V](#) or fifth degree nerve injury which involves a complete transection of the nerve trunk and so a complete neurotmesis by definition.



# Sign and Symptoms



## Sign and Symptoms

### Sensory

- There is no sensory loss as the sensory branches arise from proximal part of the facial nerve whereas Bell's palsy involves the distal area of the nerve.

### Motors

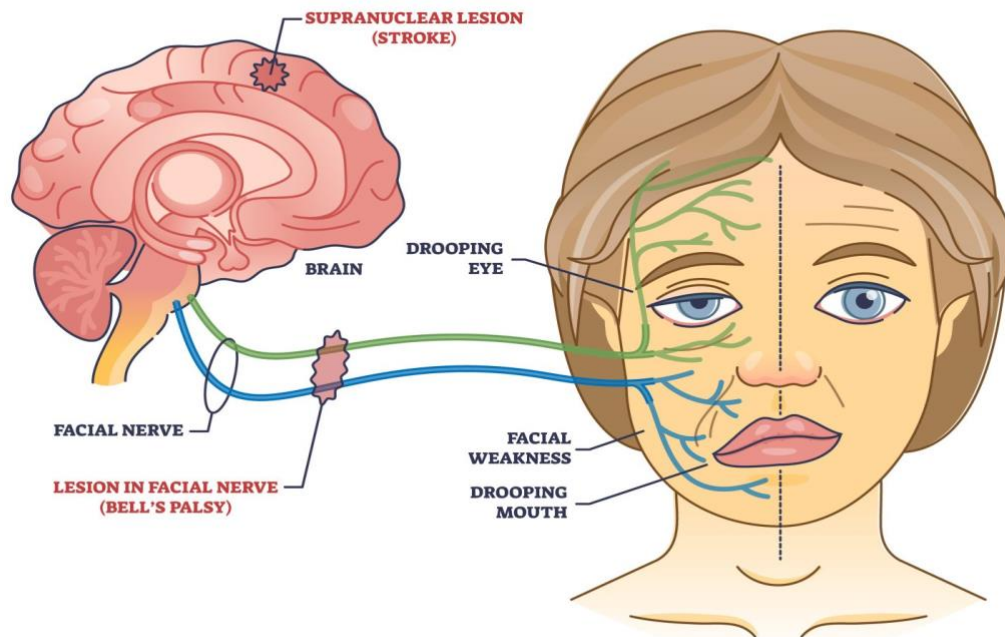
- The muscles that are paralyzed are frontalis, corrugator supercili, orbicularis oculi, nasalis, levator labii superioris and inferioris, risorius, buccinator, depressor labii orbicularis oris and mentalis.
- The facial nerve palsy is of sudden onset. The lesion is usually unilateral and rarely bilateral. Frequently pain is at the onset in the ear, mastoid region, angle of the jaw or patient may have temporal headache which can be considered as a warning signal.
- A complete interruption of the facial nerve at the stylomastoid foramen results in paralysis of all muscles of expression. Upper and lower facial muscles are usually equally affected and voluntary, emotional and associated movements are involved.

The following features may be seen in Bell's palsy -

- Drooping of the corner of the mouth.
- Creases and skin fold of the face becomes smoothed

- There will be drooping of the eyebrows and wrinkles of the brow are smoothened out.
- Forehead is without furrowing.
- Owing to the paralysis of the orbicularis oculi, the palpebral fissures is wider on the affected side and closure of the eye is impossible. When the patient attempts to close his eyes his eyeball will move upward and slightly inward this is called as Bell's phenomenon.

## FACIAL PALSY



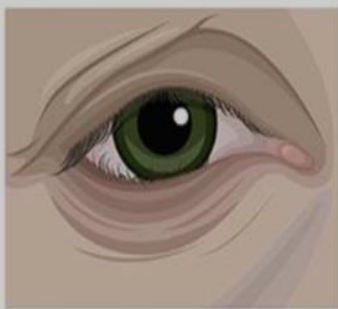
Eversion of the lower eyelid called as Ectoprism impairs absorption of tears which tend to overflow the lower eyelid.

- Retraction of mouth and pursing of the lip is not possible.
- Paralysis of buccinator leads to accumulation of food

Between the teeth and the cheek, there will also be dribbling of saliva from the corner of the mouth.

- Patient complains of heaviness or numbness of the face.
- Taste is intact.
- Distortion of the mouth causes the tongue to deviate to the sound side when protruded thus giving false impression of the hypo- glossal lesion.

## Entropion and Ectropion of the lower eyelid



Entropion



Healthy eye

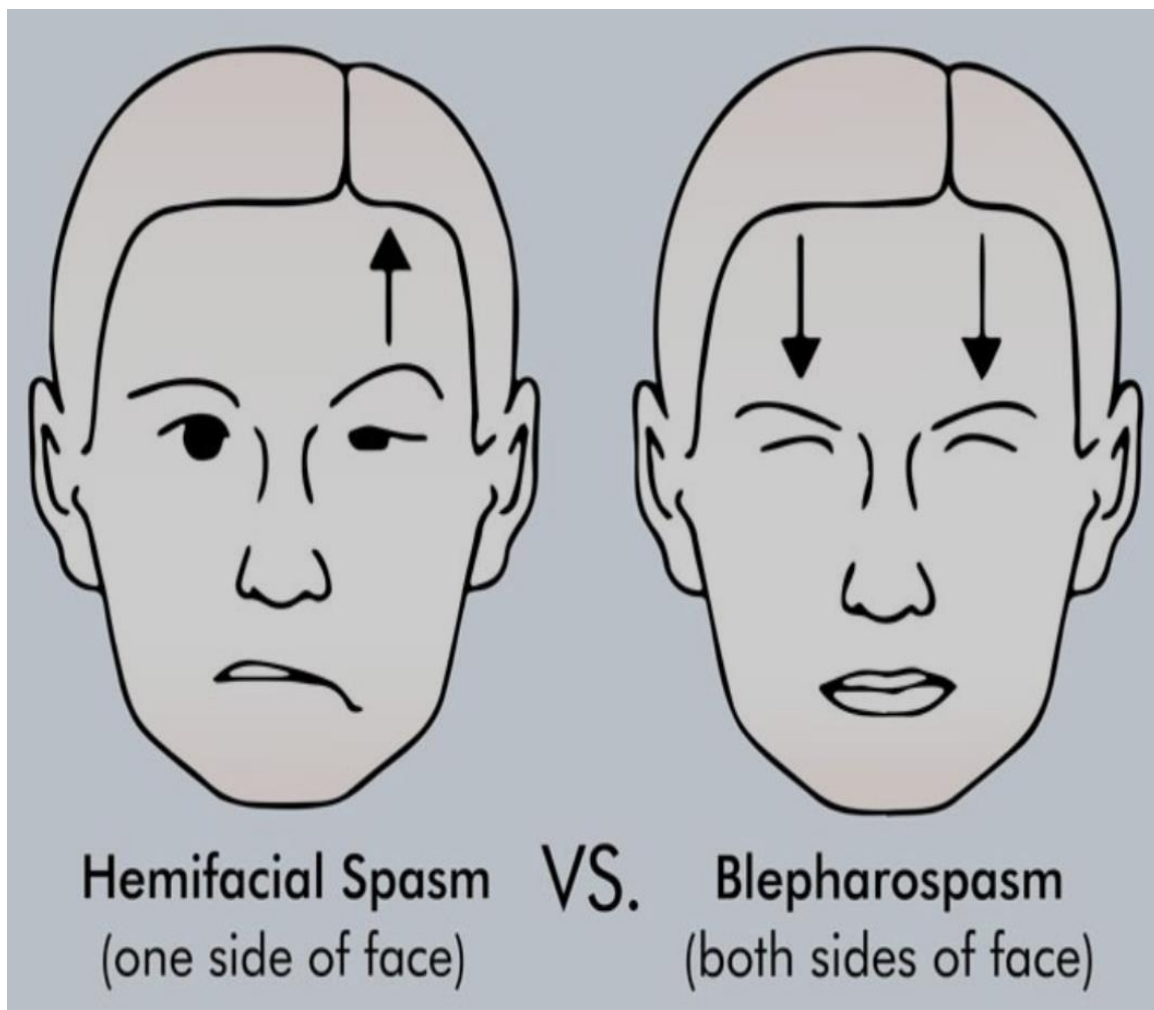


Ectropion

When the inflammation process extends upwards to involve the nerve above the point at which chorda tympani leaves it all the above symptoms occurs including the following:

- Loss of taste sensation in the anterior two third of the tongue.

- If the nerve to stapedius is involved then hyperacusis develop.
- If the geniculate ganglion or the motor nerve proximal to it is involved then lacrimation may be reduced. Infact lesion at this point will also involve the VIII cranial nerve.
- When the return of the motor function begins the smoothened nasolabial fold starts deepening.
- Attempts to move one group of facial muscles results in contraction of all of them. This is called as associated movements or synkinesis.
- Spasm of facial muscles develop and persist indefinitely by getting initiated with any facial movement. This is called as hemifacial spasm.



- Sometimes there may be anomalous regeneration of the facial nerve which results in any of the event as under:
  1. If the fibers originally connected with the orbicularis oculi become connected with the orbicularis oris, closure of the lid may cause a retraction of the corner of the mouth.
  2. If the visceromotor fibers originally innervating the salivary glands later come to innervate the lacrimal glands, anomalous tearing which is also called as crocodile tears may occur wherever the patient salivates.

## Crocodile tears syndrome

H/O - Facial nerve palsy

- Tears from right eye during mastication



**Risk factor**

## RISK FACTOR

Bell's palsy occurs more often in people who:

- Are pregnant, especially during the third trimester, or who are in the first week after giving birth.
- Have an upper respiratory infection, such as the flu or a cold.
- Have diabetes.
- Have high blood pressure.
- Have obesity.

It's rare for Bell's palsy to come back. But when it does, there's often a family history of repeated attacks. This suggests that Bell's palsy might have something to do with genes.

# Diagnosis



## Diagnosis

There's no lab test for Bell's palsy. Instead, your doctor will do a complete physical exam. They'll examine your face and ask you to make different facial expressions to see how your muscles act or they'll observe –

1. Drooping of the corner of the mouth
2. Drooping of the eyebrow
3. forehead is without furrowing
4. facial weakness

## Bell's Palsy

Inability to wrinkle brow

Drooping eyelid;  
inability to close eye

Inability to puff cheek;  
asymmetrical smile

Drooping corner of mouth;  
dry mouth



Most doctors can diagnose it based on your symptoms, but they'll also rule out other conditions such as stroke, middle ear infection, Lyme disease and tumors etc.

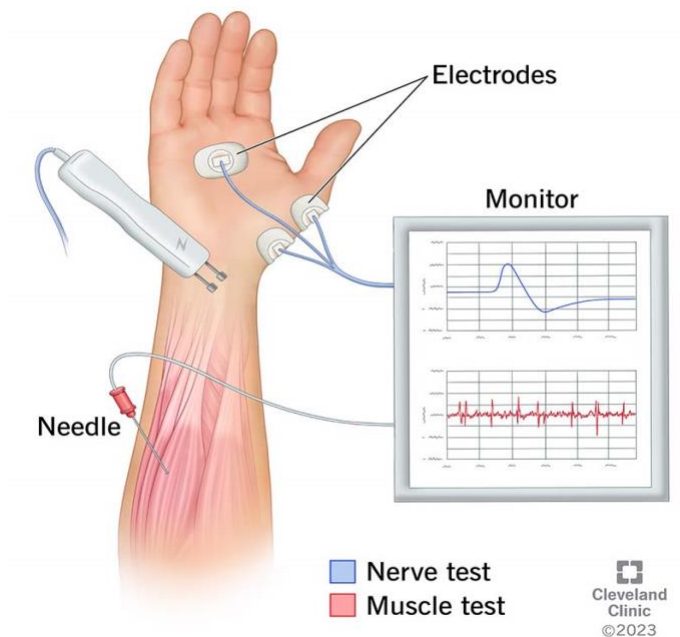
tests including:

- [Blood test](#) - to rule out infections like Lyme disease etc and other condition such diabetes etc.

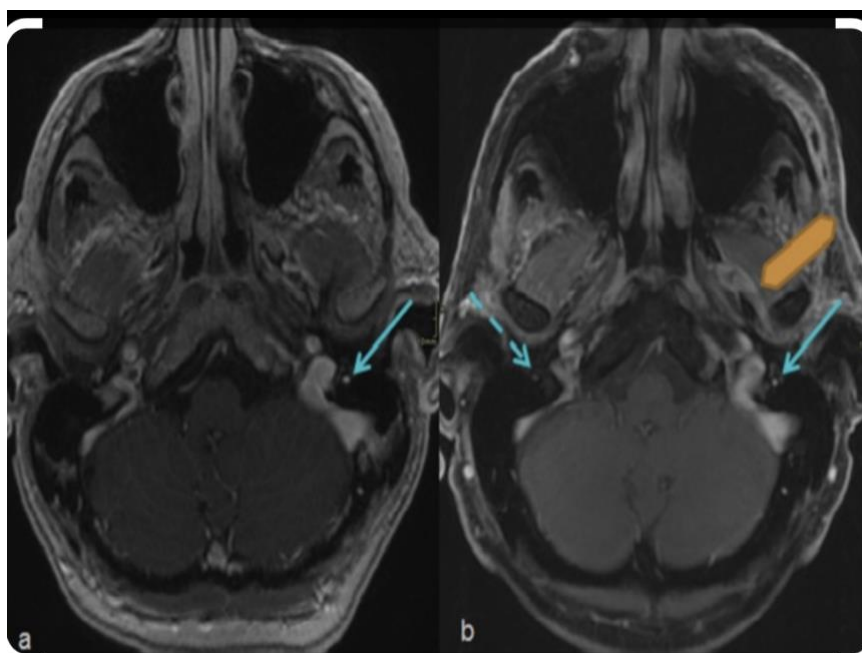


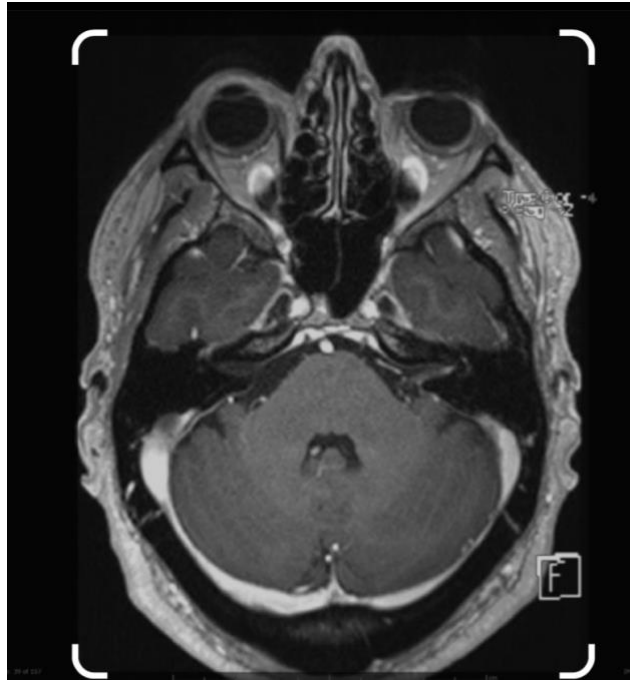
- [Electromyography \(EMG\)](#) - to check your nerve activity and see if your paralysis will get better and how fast. This test can confirm the presence of nerve damage and determine how serious it is. An EMG measures the electrical activity of a muscle in response to stimulation. It also measures the nature and speed of the conduction of electrical impulses along a nerve.

## EMG (Electromyography)



- [Magnetic resonance imaging \(MRI\) or computed tomography \(CT\) scans](#) - to eliminate other problems that can cause . It may be needed on occasion to rule out other possible sources of pressure on the facial nerve, such as a tumor or skull fracture.





### House Brackmann Grading System

The House Brackmann facial nerve grading system is widely used to characterize the degree of facial paralysis.

- [Grade 1](#) - Normal
- [Grade 2](#) – Mild dysfunction, slight weakness on close inspection, normal symmetry at rest
- [Grade 3](#) – Moderate dysfunction obvious but not disfiguring difference between sides, eye can be completely closed with effort
- [Grade 4](#) – Moderately severe, normal tone at rest, obvious weakness or asymmetry with movement, incomplete closure of eye
- [Grade 5](#) – Severe dysfunction, only barely perceptible motion, asymmetry at rest
- [Grade 6](#) – No movement

# **MANAGEMENT**

## Medical management

Treatment option for Bell's palsy's include –

- Corticosteroids such as prednisolone  
A 10 day course of treatment with oral steroids can reduce inflammation and improve the chance of a full facial recovery.



- Antiviral drugs  
In some cases doctors may prescribe an antiviral drugs such as acyclovir along with corticosteroids . The combination of antiviral and corticosteroids will probably reduce the later complications of Bell's palsy.



- Eye lubrication

If Bell's palsy prevent a person from blinking or closing their eye fully, they may develop dry eye. Changes in the tear production may worsen this. A person with dry eye has a higher risk of damage or infection in the eye.



## Surgical management

If a person does not see an improvement within a few weeks or months, surgery may be necessary.

Surgery can help:

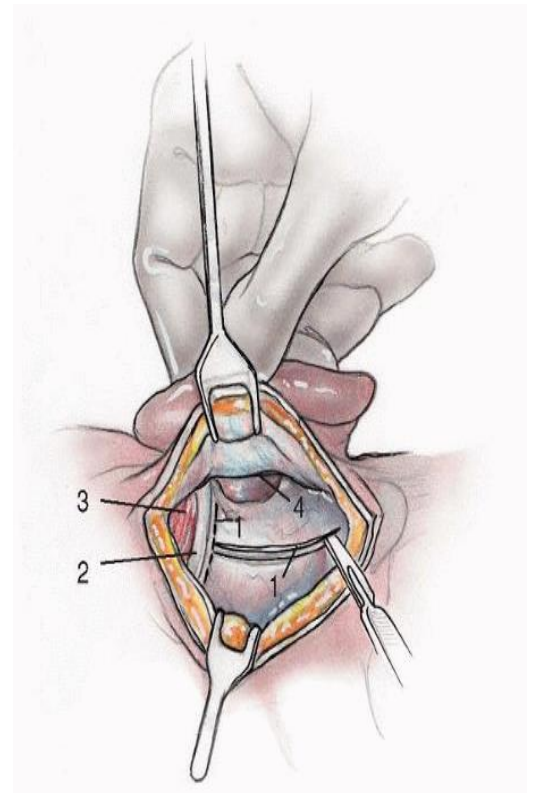
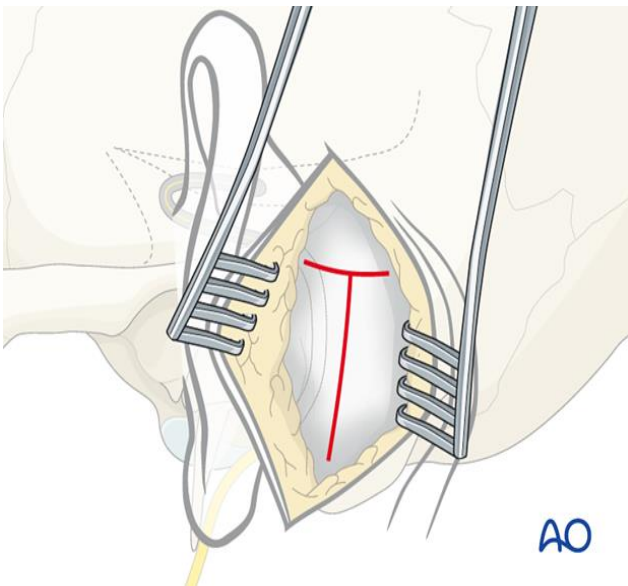
- Prevent dry eyes
- Improve facial appearance
- Reduce pressure on the nerve

Surgery are include facial nerve decompression –



## Transmastoid approach

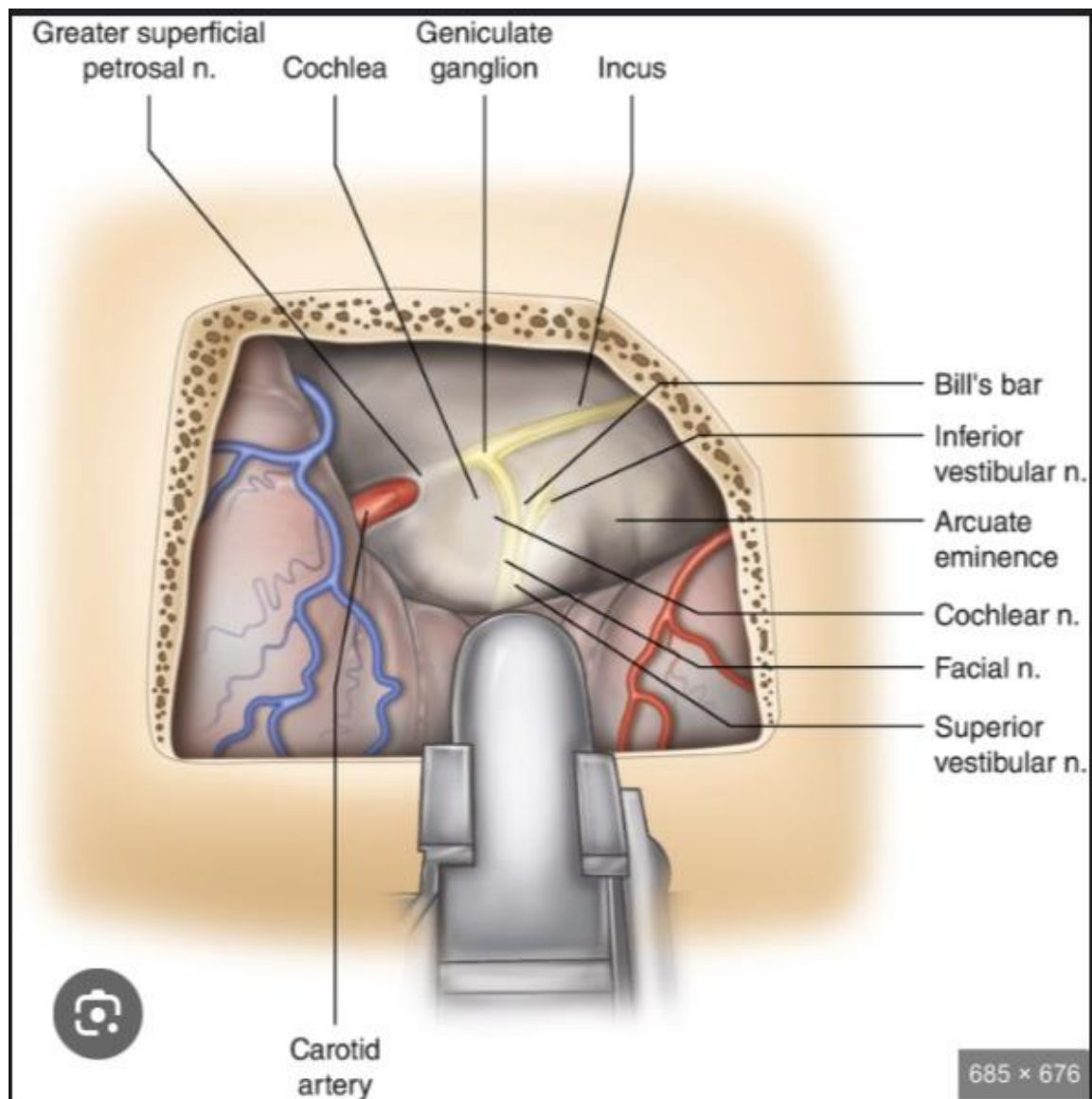
The transmastoid approach for facial nerve decompression can be utilized when the trauma is clearly localized to the tympanic or mastoid segments of the facial nerve. The nerve should be decompressed for 180 degrees of its circumference. Important landmarks for this approach include the lateral semicircular canal, fossa incudis, and digastric ridge. The incus can be removed and then replaced as an interposition graft to achieve decompression of the tympanic segment of the facial nerve all the way to the geniculate ganglion.





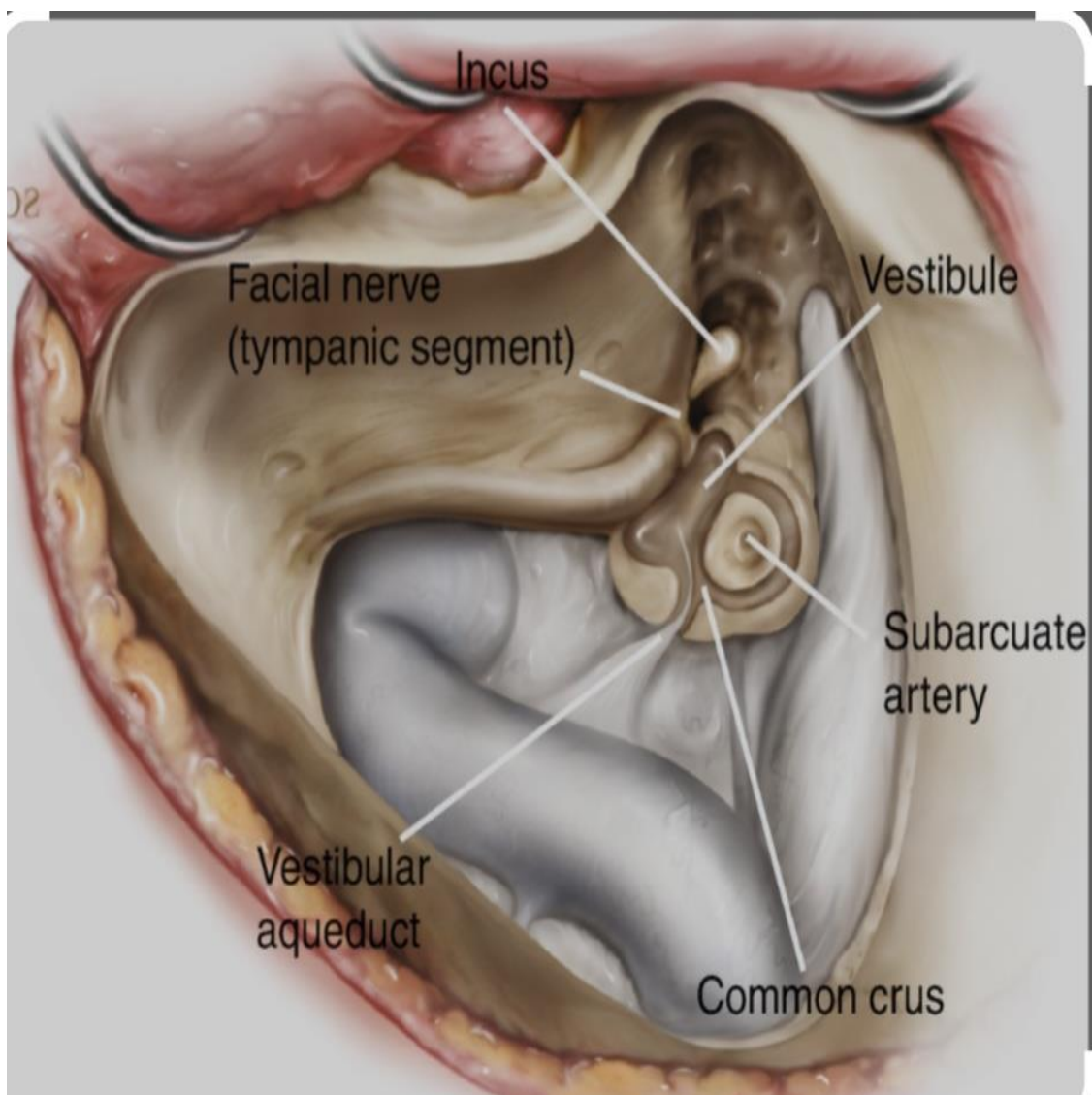
## Middle fossa approach

The middle fossa approach allows decompression of the facial nerve when the injury extends to the labyrinthine segment. It is sometimes used in combination with the transmastoid approach in cases of temporal bone trauma. Critical landmarks for this approach include the superior semicircular canal, the greater superficial petrosal nerve, and "Bill's bar" or the vertical crest separating the facial nerve from the superior vestibular nerve



## Translabyrinthine approach

The translabyrinthine approach can be utilized for decompression of the entire intratemporal course of the facial nerve in cases where cochleovestibular function is absent or has been destroyed by the trauma.



## Physiotherapy management

1.Resolving the Inflammation: If the patient comes immediately following the onset of paralysis, then he may be treated with either SWD or IR to increase the circulation in the stylomastoid foramen so that the inflammation can be resolved. If the paralysis is only due to compression or neurapraxia then the patient will show a miraculous recovery once the inflammation is resolved and compression on the nerve is relieve. Such heat modalities can be tried for a period of one week to ten days.



2.Maintenance of muscle properties: This can be achieved with Interrupted galvanic stimulation to the paralyzed muscles. It is a long duration current having duration of more than 1ms up to 300 to 600 ms . An impulse of 100 ms duration is often used which requires frequency of 30 Hz. Galvanic currents is stimulate the motor point of the muscles through the pen electrodes.



### Preparation of apparatus:

- i. Check whether all the knobs are at zero.
- ii. Checking the pins of the plug and check whether the switch is turned off.
- iii. Check the insulation of the wire.
- iv. Check whether the switch in the stimulator is working.
- v. Check whether fuse is present in the apparatus; see that it is not blown out.
- vi. Check whether hand switch for patients use is intact and is working.

### Correct positioning of the patient:

- i. Position the patient in such a way that it is comfortable to the patient.

ii. Part to be treated must be exposed and should be at adequate distance from the modality.

Correct positioning of Physiotherapist:

- i. Position of Physiotherapist should also be comfortable so that he/she may not get tired after the treatment.
- ii. Position should be such that it provides maximum accessibility to the treatment part and to the modality.

Correct placing of electrodes:

Inactive: Over the nape of neck

Active: Over the motor point.

Instructions to the patient:

- Feel of current
- Inform if any burning
- Warning not to touch anything.

3.Facial Massage: Massage is essential to maintain the circulation to the face as well as to keep the face supple. The direction of the manipulation used should be in upward direction and not downward direction as downward movements tend to stretch the paralyzed muscles more and can have deleterious effect. Massage manipulation on the face include –

- Effleurage
- Finger or thumb kneading
- Hacking
- Tapping
- Stroking

## Effleurage

- Effleurage is directed from mid line of the face to just below the ear( sub auricular gland). As much of the palmer surface of the hand as possible is used to start the strokes. The finish is always with the finger pads as the palms lift to clear the ear.
- The stroke goes from under the chin use your full hand.
- the stroke starts with the finger spread above and below the mouth use your full hand.





## Kneading

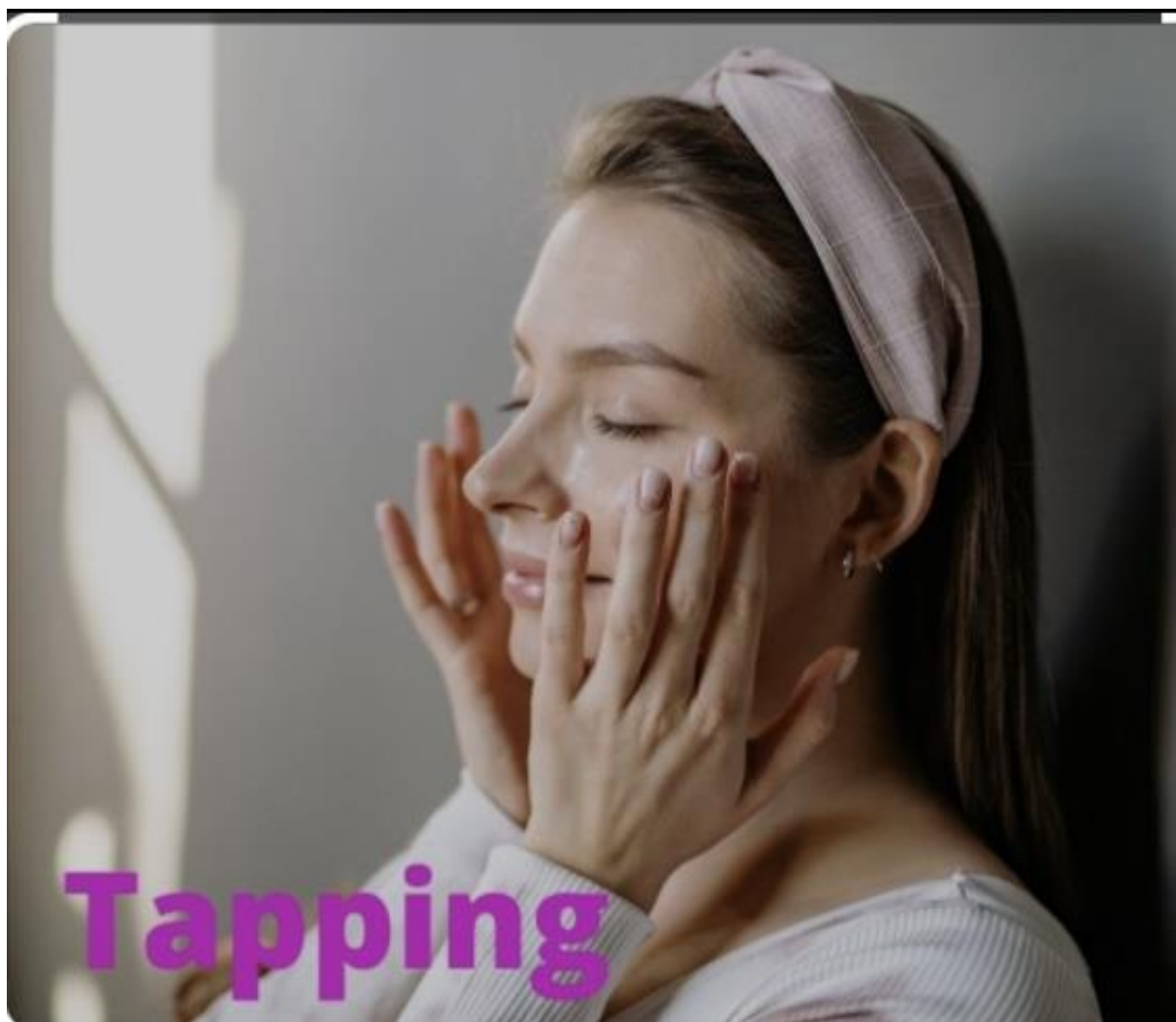
Kneading is directed from mid line of the face to sub auricular area.

- First line under the chin is done with the flat of the finger, whichh are also used on cheek to finish the next three strokes.
- Then the chin to ear line is started with the two distal phalanges.
- Next the upper lip to ear line started with one finger pad.
- The nose to ear line is done with one or two finger pad.
- On the forehead two or three line are performed with two or three finger pad.



## Tapping

Tapping is performed with the fingertip either one, two Or three finger tips are used according to size of the area of the face being treated. The work may be formed on the both side of the face simultaneously , or one side of the face at a time, in which case use your other hand to stabilize the hand.





4.Taping or splinting: These methods are used to decrease the facial asymmetry noticed in Bell's Palsy. Taping is commonly used as an adjunct or temporary technique. Taping as a protective mechanism in the presence of an existing injury.

### Aim of Taping

Tape may be used to:

1. Stabilize or support an injury
2. Relieve pain by de-loading vulnerable or painful structures
3. Facilitate normal movement, muscle action, or postural patterns.



## Application

- Use anchors proximally and distally, as tape adheres better to itself than to skin.
- Unroll the tape before laying it on the skin, to ensure correct tension.
- Apply even pressure.
- Overlap the previous tape by one-half, to ensure strength and even application.
- Smooth out all folds and creases, to prevent blisters and lacerations.
- If discomfort is present after tape application, adjust the tape.

## Removal

- Remove tape carefully with the use of tape cutters or tape scissors.

5.Continuous monitoring: The patient recovery status should be reviewed consistently. SDC is helpful in knowing the prognosis of the patient.

6.Faradic Reeducation: Only if patient can tolerate sensory stimulus of faradic current to the face, faradic reeducation is given. Other means of reeducating the movement is by using PNF techniques, visual feedback exercises etc.

7. Visual Feedback exercises: The patient may be asked to do facial exercises in front of the mirror, so that he gets a visual feedback and can perform the exercises more efficiently.

8. Facial exercises: Exercises will help to strengthen the specific muscles of the face and should be done 4-5 times a day in front of a mirror or as per the advice of your Physiotherapist. The mirror will also help you avoid letting the good side overcompensate by moving in an exaggerated way. Facial exercises are preformed to keep your brain trained in what electrical impulses are needed to control the different muscles in your face. This will help you transition back to using your facial muscles as you recover from Bell's Palsy and the paralysis goes away. Facial exercises for Bell's Palsy involve doing basic actions with the different muscle groups throughout your face.

### Do's

- You need to be patient, and work the muscles gently.
- You should go through the exercises not less than three times each day.
- Repetitions & frequency of exercises should be modified according to improvement status.
- Pay attention to your face as you exercise – focus on watching and feeling what the good side is doing, and then mentally visualize it on the Bell's palsy side and try to recreate it in tiny increments.

## Facial exercise



Sit relaxed in front of the mirror.



Gently raise eyebrows



Draw your eyebrows together  
Frown



Wringing up your nose



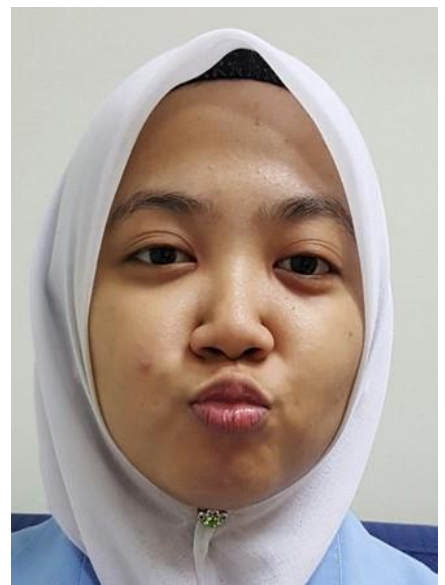
Gentle try and move corner of  
Mouth outward.



Lift one corner of the  
Mouth



Fill up your cheek with.  
air



Bring your lip  
Together and forward

## Exercise To Help Close The Eye



Look down.



Gently place the back of the  
Index finger on the eyelid,  
To keep the eye close



Close your eye as much as  
You can

# **Common Assessment**

## SUBJECTIVE

- Patient Name -
- Age -
- Gender -
- Occupational -
- Address -
- Date of admission -
- Date of discharge -

Chief Complaint - Complains of difficulty drinking without spilling on herself and drooling, headache and pain at back of jaw.

Patient complains numbness and discomfort in the affected side of the face.

## HISTORY-

Patient History – Patient presented to the hospital two days ago with facial drooping on the side. Upon examination she was given a diagnosis of Bell's Palsy which may be linked to a positive HSV1 test.

Past Medical History - Type 2 diabetes  
Hypertension  
Lyme disease

Medication - Thiazide diuretics  
Metformin  
corticosteroids.

Social History –

- Nature of work : Prolong walking, Standing or Sitting
- Smoking/ Alcohol : No

Family History – No Hereditary

Types of Pain – Numbness affected side of the face



## OBJECTIVES

### On observation – General

- Facial expressions –
  1. dropping corner of the mouth
  2. Forehead is without furrowing
  3. Wrinkles of the brow
- Deformity – facial deformity
- Posture - Abnormal
- Pain – Numbness

### On palpation

- Temperature - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

## On Examination

### Vital sign -

- Heart rate – 76 bpm
- Respiratory rate – 16 breathe/ min
- Temperature – 98.4
- Blood pressure – 120/80 mmHg

### Motor Assessment –

- MMT – 0 Grades of facial muscles
- Reflex – No show or diminished
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation of taste

- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity
- Sensory assessment
  1. Pain – Numbness
  2. Touch - No
  3. Vibration - No
- Dermatome – Not affected
- Myotome – Affected

### Diagnosis –

- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring

# **Case study**

# Case Study – 1

## SUBJECTIVE

- Patient Name – Sakshi soni
- Age - 18
- Gender – female
- Occupational - student
- Address -
- Phone no. -

Chief complain – Sudden onset of facial asymmetry.

## HISTORY-

Patient History – Sakshi Soni presented to the emergency department with a 24 hour history of the facial drooping on the left side of the her face. She noticed that her left eye would not close.

Past Medical History - Type 2 diabetes

Medication - Metformin  
corticosteroids.

Social History –

- Nature of work : Standing and Sitting
- Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Numbness affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouth

- 2. Forehead is without furrowing
- 3. Wrinkles of the brow
- Deformity – facial deformity
- Posture - Abnormal

#### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

#### On Examination

##### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

##### Motor Assessment –

- MMT – 0 Grades
- Reflex – No show or diminished
- State of higher functional
  - 1. Memory - No
  - 2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation
- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity
- Sensory assessment

1. Pain – Numbness
  2. Touch - No
- Dermatome – Not affected
  - Myotome – affected in the face

### Diagnosis –

- X – ray
- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring
- Visual feedback

## Case Study - 2

### SUBJECTIVE

- Patient Name – Palak soni
- Age -23
- Gender – female
- Occupational – house wife
- Address -
- Phone no. -

Chief complain – Patient complain I woke up this morning and couldn't move the left side of the face.

### HISTORY-

Patient History – the patient reports that she noticed the facial weakness upon waking up 9 hours ago. No pain was experienced but she has difficulty blinking with her left eye, and her smile is uneven.

Medical History – Hypertension

Medication - Metformin

Social History –

Nature of work : Standing and Sitting

Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Numbness affected side of the face and ear

### OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouth

2. Forehead is without furrowing
3. Wrinkles of the brow
4. Left eye feel dry and blinks incompletely
  - Deformity – facial deformity
  - Posture - Abnormal
  - Pain – Numbness

#### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

#### On Examination

##### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

##### Motor Assessment –

- MMT – 0 Grades or 1 Grades
- Reflex – No show
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss
- Cranial nerve examination – facial nerve damage



- Muscles tone – flaccidity
- Sensory assessment
  1. Pain – Discomfort
  2. Touch - No
- Dermatome - Not affected
- Myotome – Affected

### Diagnosis

- X – ray
- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Facial exercise
- Faradic reeducation

# Case Study - 3

## SUBJECTIVE

- Patient Name – Ankit soni
- Age - 42
- Gender – Male
- Occupational – Office worker
- Address -
- Phone no. -

Chief complain – Patient complain Sudden onset of facial droop on right side.

## HISTORY-

Patient History – The patient reports a sudden weakness on the right side of the face, making it difficult to close his right eye and smile.

Past Medical History – Stroke

Medication - Corticosteroids

Social History –

Nature of work : Sitting

Smoking/ Alcohol : No smoking/ occasional alcohol use

Family History – No family history

Types of Pain – discomfort affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouth
  2. Forehead is without furrowing

3. Left eye feel dry and blinks incompletely

4. Difficulty in smile

- Deformity – facial deformity
- Posture - Abnormal
- Pain – Numbness

#### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

#### On Examination

##### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

##### Motor Assessment –

- MMT – 0 Grades or 1 Grades
  - Reflex – No show
  - State of higher functional
1. Memory – No
  2. Emotional state - No
- Vision - No
  - Speech – difficulty in speech or slurred speech
  - Taste - loss
  - Cranial nerve examination – facial nerve damage
  - Muscles tone – flaccidity

- Sensory assessment
  1. Pain – Discomfort
  2. Touch - No
- Dermatome - Not affected
- Myotome – Affected

### Diagnosis

- X – ray
- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring
- Faradic reeducation
- Facial exercises

# Case Study – 4

## SUBJECTIVE

- Patient Name – Priyal
- Age -32
- Gender – female
- Occupational – house wife
- Address -
- Phone no. -

Chief complain – Patient complain ear pain and loss of taste on left side of the tongue and sudden onset of the facial paralysis.

## HISTORY

Patient History – She reports recent onset of ear pain and discharge from the left ear. Mild hearing loss was noted on the left side.

Medical History – Recurrent middle ear infection

Medication - Over the counter ear drops

Social History –

Nature of work : Standing and Sitting

Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Numbness affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouth

2. Forehead is without furrowing
  3. Left eye feel dry and blinks incompletely
  4. Inability to close the eyes
- Deformity – facial deformity
  - Posture - Abnormal

#### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

#### On Examination

##### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

##### Motor Assessment –

- MMT – 0 Grades or 1 Grades
  - Reflex – No show
  - State of higher functional
1. Memory - No
  2. Emotional state - No
- Vision - No
  - Speech – difficulty in speech
  - Taste - loss
  - Cranial nerve examination – facial nerve damage
  - Muscles tone – flaccidity

- Sensory assessment
  1. Pain – Discomfort
  2. Touch - No
- Dermatome - Not affected
- Myotome – Affected

### Diagnosis

- X – ray
- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring
- Faradic reeducation
- Facial exercise

# Case Study – 5

## SUBJECTIVE

- Patient Name – Yashi soni
- Age - 21
- Gender – female
- Occupational - student
- Address -
- Phone no. -

Chief complain – Sudden onset of facial paralysis, Instability to close the eyes, drooping of the mouth.

## HISTORY-

Patient History – Yashi presented to the emergency room with the sudden onset of facial asymmetry that developed over several hours. Two months prior Yashi had tested positive for COVID – 19.

Past Medical History – COVID – 19

Medication - corticosteroids.

Social History –

- Nature of work : Standing and Sitting
- Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Numbness affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouths



- 2. Forehead is without furrowing
- 3. Wrinkles of the brow
- 4. Instability to close the eyes
  - Deformity – facial deformity
  - Posture - Abnormal

#### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

#### On Examination

##### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

##### Motor Assessment –

- MMT – 0 Grades
- Reflex – No show or diminished
- State of higher functional
  - 1. Memory - No
  - 2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation
- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity

- Sensory assessment
  1. Pain – Numbness
  2. Touch - No
- Dermatome – Not affected
- Myotome – affected in the face

### Diagnosis –

- X – ray
- CT scan
- MRI
- Blood test
- COVID -19 antibody test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring
- Faradic reeducation
- Facial exercise

# Case Study – 6

## SUBJECTIVE

- Patient Name – dev soni
- Age - 34
- Gender – Male
- Occupational – office workers
- Address -
- Phone no. -

Chief complain - Patient complain with sudden facial weakness and he reports difficulty closing his eyes , difficulty in speech and eating.

## HISTORY-

Patient History – The patient began experiencing these symptoms 3 days ago. There was no associated pain , but he reports a feeling of numbness on one side of the face. one week prior, the patient had an upper respiratory infection, likely viral in nature.

Past Medical History – Upper respiratory infection

Medication - corticosteroids

Social History –

- Nature of work : Standing and Sitting
- Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Discomfort affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –

1. dropping corner of the mouth
2. Forehead is without furrowing
3. Difficulty in eating
4. Instability to close the eyes
  - Deformity – facial deformity
  - Posture - Abnormal

#### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

#### On Examination

##### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

##### Motor Assessment –

- MMT – 0 Grades
- Reflex – deep tendon reflexes are normal
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation
- Cranial nerve examination – facial nerve damage

- Muscles tone – flaccidity
- Sensory assessment
- 1. Touch - No
- 2. Vibration – No
- Dermatome – Not affected
- Myotome – affected in one side of the face

### Diagnosis –

- X – ray
- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Faradic reeducation
- Facial exercise

# Case Study – 7

## SUBJECTIVE

- Patient Name – Aman soni
- Age - 34
- Gender – Male
- Occupational – office workers
- Address -
- Phone no. -

Chief complain – Sudden onset of facial weakness ,Instability to close the eyes, drooping of the mouth and loss of taste on one side of tongue.

## HISTORY-

Patient history – A 34 year old male presents with a 2 day history bot one sided facial weakness.No associated feve and headache, but the patient recall a tick bite approximately 3 weeks ago while hiking in a wooded area.

Past Medical History – Generally healthy, no known chronic illnesses.

Medication - None

Social History –

- Nature of work : Standing and Sitting
- Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Numbness affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouth
  2. Forehead is without furrowing
  3. Wrinkles of the brow
  4. Instability to close the eyes
- Deformity – facial deformity
- Posture - Abnormal

### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

### On Examination

#### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

#### Motor Assessment –

- MMT – 0 Grades
- Reflex – Normal
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation

- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity
- Sensory assessment
  1. Touch - No
  2. Vibration – No
  3. Proprioception - No
- Dermatome – Not affected
- Myotome – affected in one side of the face

### Diagnosis –

- CT scan
- MRI
- Blood test
- Lyme serology
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring



# Case Study – 8

## SUBJECTIVE

- Patient Name – Neeta soni
- Age - 40
- Gender – female
- Occupational – office workers
- Address -
- Phone no. -

Chief complain – Sudden onset of weakness on one side of the face for the past 24 hours.

## HISTORY-

Patient history – the patient reports that she woke up with facial drooping, instability to close her eyes and difficulty smiling on one side .

Past Medical History – Obesity  
Hypertension

Medication - Lisinopril  
corticosteroids.

Social History –

- Nature of work : sitting
- Smoking/ Alcohol : NIL
- Sedentary lifestyle , no regular physical activity

Family History – hypertension or no history of other condition

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of mouth
  2. Wrinkles of the brow
  3. Instability to close the eyes
- Deformity – facial deformity
- Posture - Abnormal

### On palpation

- Temperature - No
- Tenderness - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

### On Examination

#### Vital sign -

- Heart rate – 78 bpm
- Respiratory rate – Normal
- BMI – 32 (obese)
- Blood pressure – 130/85 mmHg

#### Motor Assessment –

- MMT – 0 or 1 grades
- Reflex – Diminished
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech or slurred
- Taste - loss or decrease sensation
- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity

- Sensory assessment
  1. Pain – Numbness
  2. Touch - No
- Dermatome – Not affected
- Myotome – affected in the face

### Diagnosis –

- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication
- Lisinopril for hypertension

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Continuous monitoring
- Visual feedback
- Facial exercises

## Case Study – 9

### SUBJECTIVE

- Patient Name – Neeraj soni
- Age -56
- Gender – Male
- Occupational – Teachers
- Address -
- Phone no. -

Chief complain – Sudden onset of facial paralysis, Instability to close the eyes, drooping of the mouth which began 12 hours ago.

### HISTORY-

Patient History – The patient reports that he woke up with one sided o facial weakness . His blood sugar level have been fluctuating recently due to non adherence to diabetes medication .

Past Medical History – Types 2 diabetes mellitus  
Hypertension

Medication - Metformin  
Lisinopril  
Simvastatin

### Social History –

- Nature of work : Standing and Sitting
- Smoking/ Alcohol : NIL

Family History – Types 2 diabetes mellitus

Types of Pain – Numbness affected side of the face

## OBJECTIVES

### On observation – General

- Facial expressions –
  1. dropping corner of the mouth
  2. Forehead is without furrowing
  3. Wrinkles of the brow
- Deformity – facial deformity

### On palpation

- Temperature - No
- Tenderness - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

## On Examination

### Vital sign -

- Heart rate – 78 bpm
- Respiratory rate – 16 bpm
- Temperature – Normal
- Blood pressure – 142/88 mmHg
- Blood glucose – 210 mg /dl

### Motor Assessment –

- MMT – 0 or 1 grade
- Reflex – No show or diminished
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation

- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity
- Sensory assessment
  1. Touch – No
  2. Vibration – No
  3. Proprioception - No
- Dermatome – Not affected
- Myotome – affected in one side of the face

### Diagnosis –

- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Facial exercises

# Case Study – 10

## SUBJECTIVE

- Patient Name – Akhil soni
- Age - 34
- Gender – Male
- Occupational – office workers
- Address -
- Phone no. -

Chief complain – Inability to move the right side of the facial and inability to close the right eyes, drooping of the mouth.

## HISTORY-

Patient History – The patient was involved in a motor vehicle accident (MVA) and sustained a right temporal skull fracture. After the accident, the patient noticed progressive weakness in the right side of the face over the next 24 hours.

Past Medical History – Unremarkable, except for recent head injury from the accident.

Medication - corticosteroids.

Social History –

- Nature of work : Standing and Sitting
- Smoking/ Alcohol : NIL

Family History – No family history

Types of Pain – Numbness affected side of the face

## OBJECTIVES

On observation – General

- Facial expressions –
  1. dropping corner of the mouth
  2. Forehead is without furrowing
  3. Wrinkles of the brow
  4. Instability to close the eyes
- Deformity – facial deformity
- Posture - Abnormal

### On palpation

- Temperature - No
- Tenderness - No
- Oedema - No
- Inflammation sign - No
- Muscles wasting – yes
- Contracture - No

### On Examination

#### Vital sign -

- Heart rate – Normal
- Respiratory rate – Normal
- Temperature – Normal
- Blood pressure – Normal

#### Motor Assessment –

- MMT – 0 or 1 grade
- Reflex – No show or diminished
- State of higher functional
  1. Memory - No
  2. Emotional state - No
- Vision - No
- Speech – difficulty in speech
- Taste - loss or decrease sensation



- Cranial nerve examination – facial nerve damage
- Muscles tone – flaccidity
- Sensory assessment
  1. Touch – No
  2. Vibration – No
- Dermatome – Not affected
- Myotome – affected in the face

### Diagnosis –

- X – ray
- CT scan
- MRI
- Blood test
- Physical examination

### Management

#### Medical management

- Corticosteroids such as prednisolone
- Antiviral drugs such as acyclovir
- Eye lubrication

#### Surgical management

- Transmastoid approach
- Middle fossa approach
- Translabyrinthine approach

#### Physiotherapy management

- Resolving the inflammation
- Maintain the muscle properties
- Facial massage
- Tapping
- Facial exercises

# **Review of literature**

# Review of literature

## **BOOKS :**

- Anatomy B.D Chaurasia
- PT Neuro Gladys Samuel Raj
- S Sunder

## **WEBSITES :**

- <https://my.clevelandclinic.org/health/diseases/bell-palsy>
- <https://www.hopkinsmedicine.org/health/condition/bell-palsy>
- <https://www.healthdirect.gov.au/amp/article/bell-palsy>
- <https://www.physio.pedia.com/bell-palsy>

